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of carpenters' glue, which stir well into the paste. Take a small sponge or broad flat varnish brush and moisten the back of the lincrusta all over with the mixture; then lay it carefully on the panel of wood; press out all air holes and see that the lincrusta adheres to the wood in every part. Leave the panel—or panels if more than one—to dry for a few hours.

The next thing to be done, and it is absolutely necessary to insure success, is to give the lincrusta a coat of shellac, or hard drying Japan varnish, which is cheaper than shellac and answers the purpose almost if not quite as well. Lay the panels flat on a table and apply the shellac with a bristle brush. Shellac or Japan varnish dries very quickly, apparently within an hour, but it is better to leave it several hours so that it may harden thoroughly.

Of the bronze powders there are various shades to choose from; the most useful are pale gold, rich gold, French leaf pale and rich gold, copper, bronze, crimson, fire, chocolate, silver, green, blue, lemon and orange.

To liquefy these powders a special medium is prepared. Stir the powder selected well into the medium and apply it with a broad fitch brush. Fitch brushes are made of ox-hair dyed. If the space to be covered is large, a brush four or five inches broad should be used. Amateurs are apt to employ brushes too small for the purpose; this makes it difficult to procure a flat coat.

TAPESTRY PAINTING.

III.

DRAPERY may be treated in two different ways: either by laying in the palest tint as a flat wash, to begin with, or by blocking in the darkest shadows in the first instance; afterward, when these are quite dry, applying the lightest tint over all; then, when this wash is partially dry, painting in the half-tones.

It is well, perhaps, to adopt the first method when the color to be used is particularly delicate; but, as a rule, I recommend the latter plan, because, in following it, the drawing can be better secured, and this is quite as essential in painting the drapery as when working on the face, hands and feet; for it should never be forgotten when painting drapery that the form beneath must be indicated; otherwise, all artistic feeling will be lost.

Drapery can never be properly finished in one painting, but every effort must be made to carry it as far as possible in the first painting, so that strengthening and sharpening up in parts, with a few touches of the knife on the high lights, will be all that is necessary to finish it. It is so much easier to bring the work together, to alter relative tones and to model up generally before the color is quite dry and set. It is never really desirable to wet the work all over in the second painting, although sometimes it is necessary, as such a proceeding entails a third painting for the finishing touches. One great advantage when working with tapestry colors is that the dyes, being perfectly transparent, it is possible to change entirely a tint by scrubbing another into it; thus if your color be too bright—and this is often the case with beginners, on account of the strength of the dyes—you have only to pass over it a pale wash of its complementary tint, and you at once dull the vividness of the tone. Of course, this makes the whole thing a little darker than possibly you intended, but this is surely better than crudeness, which is especially to be deprecated for tapestries.

We will now turn our attention to the general treatment of foliage, strictly from a decorative standpoint.

If possible, the distant trees and shrubs and the groundwork for the foliage in the foreground should be laid in before the sky is quite dry; because the edges will then blend sufficiently to give the softened and hazy effect caused by the atmosphere surrounding distant objects. For trees far away—to mark in their form, a mixture of indigo and cochineal is invariably used very much diluted, as both colors are strong. This combination makes a beautiful purple gray, especially when painted into a sunset sky. Having indicated the form of the trees with this color, a little gray green may be introduced to model them up. This shade can be made with emerald green, cochineal and a little yellow. The same gray green may be used as the foundation for more prominent foliage, and should be laid on in broad masses; vary the depth of tone according to the disposition of light and shade. When this groundwork is dry, the main stems and little branches that carry the leaves should be indicated, and these in their turn must be clothed with stronger and yellower shades of green,

made by mixing indigo, yellow and sanguine in different degrees. Much detail or working up should not be attempted, as decorative work should not be labored. A few strong, clear touches should indicate the outside leaflets; the rest should be painted in a broad style, care being taken that the touch of the brush is horizontal, as this gives the feeling of spreading foliage.

The trunks of trees must be treated according to their kind. When the bark is rough and gnarled, as with an oak or an elm, then begin by putting in the shadows, caused by the rough surface, with brown. Use an ordinary flat hog-hair oil-painting brush about half an inch broad; this, being longer and softer in the bristles than a tapestry brush, will give the desired broken surface. The local wash must be of a blue gray. When this wash is dry, some green must be dragged over it in places, to give it a mossy appearance.

For trees with smooth trunks, such as ash or maple, quite a different mode of treatment is required. In the first place, put on every bright tint you can find on your palette, keeping them light and merging one into the other; then, before these are quite dry, put on a very wet wash of rather light gray over all, introducing some brown on the shadow side. The patches of light and shade noticeable on these smooth trunks can be accentuated in retouching and by the aid of an eraser.

A few remarks on the best method of manipulating stonework may be acceptable, especially as there is a good deal of it in the two illustrations after Boucher, one given in this number and the other in the last.

Nothing looks worse than to paint stone only in grays, although the effect of gray stone must be given; just as in water-color life must be imparted to it by variety of color. To this end, put out on your palette a little of almost every color; dilute them well with water and medium; then take a long-haired, somewhat soft bristle brush, and paint these colors in separately and brokenly, giving the appearance of delicate rainbow hues. When this painting is dry, model up with gray in different shades, taking care to subdue the colors beneath sufficiently, so that they do not attract the eye or strike you as being there at all. You can, if you wish the better to secure your drawing, put in the principal markings in gray before applying the different tints; but this is optional. This manner of painting stonework is perfectly legitimate; for if you examine an old stone-wall you will find that time, sunshine, frost, and rain have left their impress in stains of many colors, which, though subdued, are still there and must be reproduced to give the appearance of reality.

The panel after Boucher published herewith resembles in style that given in the December issue, and the general treatment must be similar. The painting of flesh was fully entered into in my last chapter; it is not therefore necessary to repeat directions for its treatment.

For a scheme of color I would suggest the following prominent group: Heliotrope coat, yellow breeches and waistcoat, with white vest, for the shepherd. Pale pink dress, with wreath of pink roses in the hair, for foremost shepherdess. For the centre figure, turquoise blue underskirt and white overdress. For the third figure, a terra-cotta dress with a pale blue kerchief. For heliotrope, mix ultramarine, ponceau and cochineal; a touch of sanguine will be needed in the shadows. Yellow must be shaded with a mixture of yellow, sanguine and indigo; pure yellow much diluted is the color for the light wash. For pale pink, the light wash is composed of ponceau with a touch of yellow in it; this makes salmon pink. Shade with some gray added to the above mixture, and here and there introduce also a touch of sanguine. For turquoise blue, mix ultramarine and emerald green much diluted; shade this with a little yellow and sanguine added to the same colors. Terra cotta is obtained by mixing sanguine yellow, cochineal and ponceau with some indigo added in the shadows. The grassy bank in the foreground of the picture is best painted by laying in first, with a large brush, a delicate wash of yellow green, made by mixing a pale tint of yellow and emerald green, with a dash of cochineal in it, to take off the crudeness. When this wash is dry, the small grasses and leaves can be painted in with varied shades of green and brown. The water must reflect the sky and bank.

For painting the sky, foliage and stonework, directions have already been given in this and the last number. Next month I propose to tell in detail the best way to steam tapestries in order to fix them properly, so that those who wish to do so can undertake the process for themselves.

EMMA HAYWOOD.

China Painting.

LETTERS TO A YOUNG LADY

WHO ASKS IF SHE CAN LEARN CHINA PAINTING.

II.

THE interest evinced in my published letter to you leads me to answer your reply in print, for the advantage of those who, passing through your experiences, may meet with the same difficulties.

You tell me the first serious obstacle came to you in the wrongly filled order which you sent to the art store in the city. Provoking, indeed! This annoyance is by no means confined to your own experience. Clerks are very apt to substitute a different article, if just the one ordered is not at hand, assuming that it is "just as good." Especially is this true of art materials, where such a variety exists. Never give up the point, however; claim the very article your list calls for in every case.

This is the reason—and you can now understand how good a one—why teachers prefer to select the art materials of their pupils.

"They said at —'s that this cadmium was just as good as Winsor & Newton's;" or, "They said Mr. So-and-so always used small brushes, and the large ones were of no use in flower painting;" or, "You *must* have two palette knives for mineral colors; if you use a steel knife with some colors, they will not fire out accurately"—and so forth and so forth.

Teachers have heard these expressions so often that they heartily wish they could keep an art store of their own, for the benefit of their own students.

All I can say to you is this: Send the goods back, and if they cannot fill your list, beg them to return it, and send elsewhere. Never fear but you will get the very articles you specify, if you persist.

You rubbed up the paints too thin at first, but the second time managed them right. So far so good. Yes, it was inspiring to see the test tile neatly covered with the paints, and absolutely exhilarating to find scarcely any difference in the tone of the fired colors from those taken fresh from the tube.

This cannot be said of *all* the mineral colors; but it might safely be assumed of those composing your repertoire. As you progress and combine one color with another, you will come to understand that some will not bear as strong firing as others—will, indeed, be actually consumed by the color mixed with it. If you will learn by the experience of others, you may set it down as a principle that yellows destroy, or *eat up*, every color mixed with them except green. That color, a composition of yellow and blue, seems to stand any fire. Browns, if used alone, retain their color well; so do reds; but if used with yellow disappear, with one exception—capucine red—which you will like to use by and by. This color will bear a very strong fire, but will be more glossy or rather more highly glazed if you mix with it one third of flux. That is a new term to you, and I must explain it. All the mineral colors are mixed in their preparation with flux, the same material that composes the glaze on china. When the colors are painted on this glaze and fired, the heat causes them to blend with the glaze and remain permanent. Now, by adding a little more glaze with the colors, do you not see that a higher glaze will be produced? This is by no means necessary with *all* the colors, although I think when you have gained some experience you will like to use a *little* with each. I am delighted with some recent trials of my own in this direction. But do not use too much. When I speak of a strong firing and a light firing you are puzzled.

I wish you might see a kiln for firing china in operation; but as you cannot at present, let me say that there are some places in the kiln that are hotter than others—in fact, nearer the fire and of course hotter.

In placing the china in the kiln, the workman, if he understands his business, will place those pieces painted to endure more heat in the hottest places. But sometimes he is not educated in color, and only understands the more mechanical operation of protecting one piece of china from another in position; and in such cases the china suffers, and the amateur suffers still more.

And just here let me give you some advice. By and by, when you have painted a dozen pieces of china and gained all it seems possible to do by yourself (you will have sold at least some of your work to admiring friends), take your earnings and go to the city for a few good



"THE FOUNTAIN OF LOVE." TAPESTRY PAINTING DESIGN AFTER BOUCHER.

lessons. Do not take class lessons; you are prepared now to take in all that private lessons can give you; and if they are more expensive, I can safely say, if your teacher is a good one, you will be the gainer ten times over.

Then the next thing will be a kiln, the smallest gas kiln, which you can easily learn to manage. Do you not see that when it is known that you can fire the china, without sending to the city, pupils will come to you almost unsought? Am I going too fast for you? I am sure by this time that your wings are growing. And what is the use of wings, but for soaring?

Having once learned the philosophy of a kiln, how much easier to learn the philosophy of mineral painting! As I stated in my first letter, so much has been said about gold colors not combining with iron colors, and vice versa, that the amateur is greatly perplexed, and awaits the test of firing with anxiety. Dismiss all this nonsense from your mind. The steel palette knife will *not* affect your gold colors, or even the gold itself, if it is perfectly clean, and the palette and turpentine are clean also. You can mix the violets of gold (which are the purples) and the carmines (which are the rose colors) with even violet of iron, which surely comes from iron, with impunity, if you observe the same precautions for cleanliness.

You will soon learn that most of the mineral colors look best spread delicately on the china surface. You can paint them on thickly, so the design looks like an old chromo card; but the real beauty of the work consists in its delicacy. If the colors are dull when quite dry, you may be sure they will fire out well. If very, very glossy, they will not be dry for days, and then you may be sure you have used too much oil, and you may as well erase your work. Carmine, especially if you wish to represent rose color, must be very faintly washed on; and as this color, if fired too much, results in a light pink purple, I have found it safer to use Carnation No. 1 for pink flowers of all descriptions. This must be delicately painted also, quite as much so as the carmine; but then it is never disappointing. You can shade it also with violet of iron or with carnation and dark green No. 7 mixed together with excellent results.

I can assure you that flowers on china, simply treated, with few colors are most effective, and really most pleasing. Keep diligently to this class of subject, for a while at least. By and by we may have to consider more ambitious flights.

Continue, in the mean while, to let me know of your difficulties, and I will do my best to show you how to overcome them.

L. STEELE KELLOGG.

WE give this month the last of the series of fish-plate designs interrupted by the pressure of holiday matter. Paint the rocks greenish gray, with dark shadows of the same color. For the weed on the top use jonquil yellow as the foundation color, and shade with red brown and brown 108. In the barnacles, the long, thin neck is to be yellow brown shaded with brown 108. The outer shells are blue gray, shaded with the same color; a rim of red brown outlines the edges. The fish should be painted yellow ochre, shaded with brown, with fins red, shaded with gray; tail yellow brown with dark brown markings. The water-lines are blue green.

* * *

AN authority on the subject says that, since the tulip mania in the Netherlands until now, no one group of plants has taken such a firm hold of popular fancy as the orchids of to-day. They differ from all other flow-

tirely pure white, and it requires a background to bring it out. Any delicate tint—blue, pink or green—would be pretty. Remove the undertint for the design. The flowers are a creamy white, and, as the white of the china would be too white, a wash of pale yellow (yellow ochre) over them is necessary. The shadows should be a greenish gray and very delicate. The ends of the petals are tipped with bright yellow, and there is an irregular blotch of the same color inside the centre tubular petal or lip. The leaves and stems are grass green, shaded with brown green. The under side should be lighter and bluer in tint.

* * *

FOR the crescent salad-plate designs given herewith, the third and fourth of the series, "Kappa" furnishes the following directions for treatment: Edge each plate and outline the design with gold. Use gold also for the

crescent in the centre, outlining it with brown green. For No. 4 (potentilla), use silver yellow for the flower, with dots of gold for the stamen tips; use brown green for the stalks, adding apple green for the leaves. If gold is not used, outline with brown green, using yellow brown for the crescent. For No. 3 (chickweed) use apple green for the centre of the flower, leaving the white of the china for the slender ray-like petals. For the calyx, the buds and the stalks use a little brown green with apple green, adding emerald green for the leaves. If gold is not used, outline with brown green. For a background for the set, use either the white of the china, Chinese yellow or celadon.

* * *

THE vase illustrated on the opposite page may be decorated with matt colors and outlined with gold,



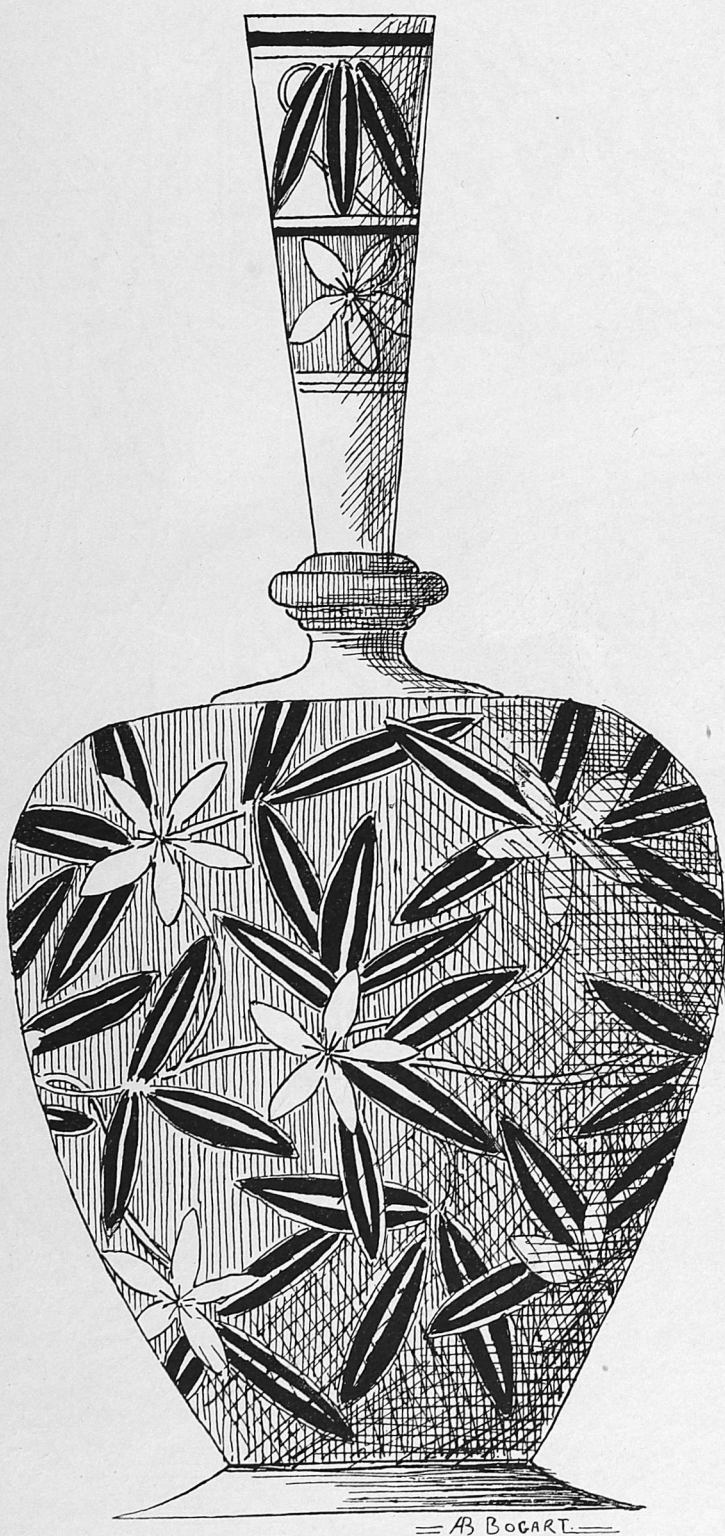
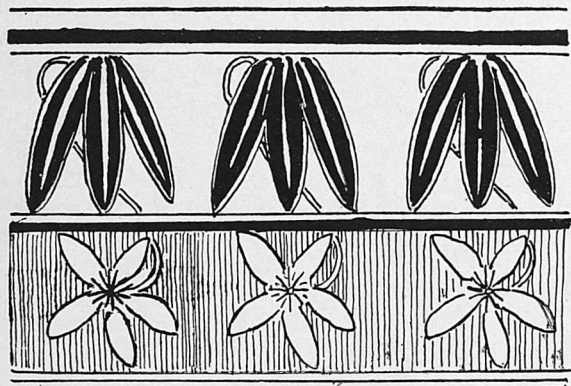
SALAD PLATES (CRESCENT SERIES)—NO. 3, CHICKWEED; NO. 4, POTENTILLA (CINQFOIL).

ers; some of them are large, showy, even gorgeous. Beautiful as most of them are, there are many which are small and sombre in coloring. A large proportion have green or yellow blossoms. Some are white-flowered, with rose or purple markings. They are also of various shades of rose and purple. The yellow ones are rarely without brown markings, or the white without some yellow or green coloring. Bright red or scarlet ones are rare, and those of any shade of blue are rarest of all. Green and yellow and white are the prevailing colors. One of the three inner petals is usually peculiar in shape and color; it is called the lip, its object being to attract insects, which are, as a rule, necessary to fertilize these flowers.

* * *

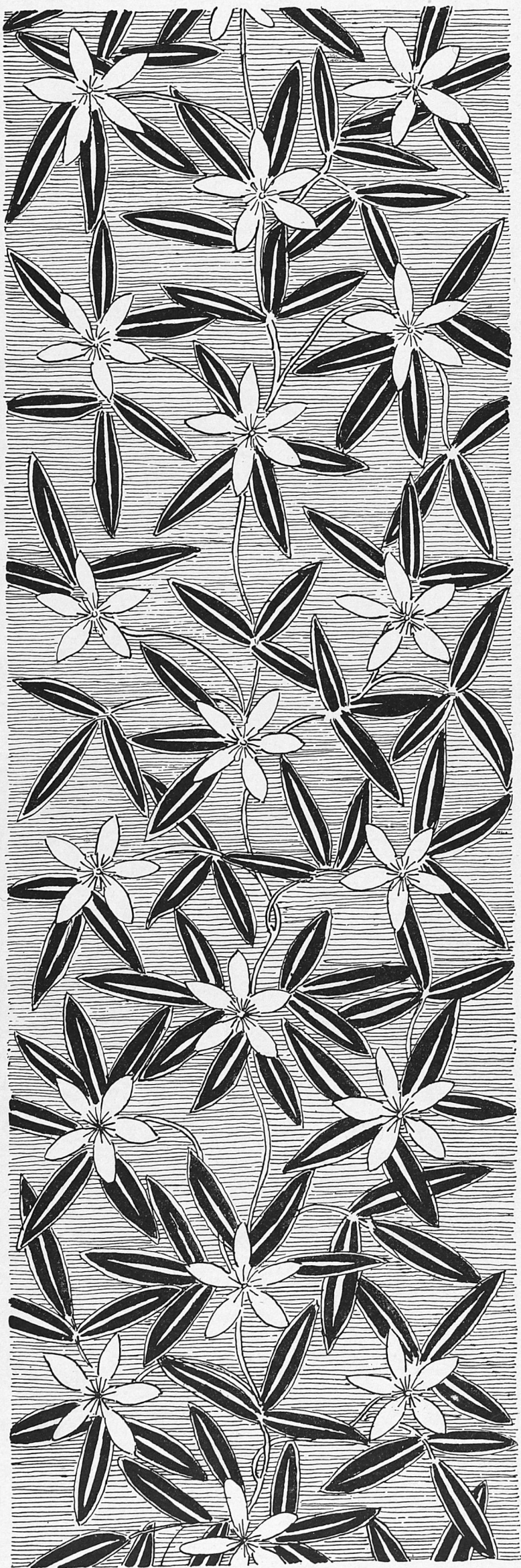
THE orchid plate (Cattleya) which we give this month (the fourth of the series of twelve) is almost en-

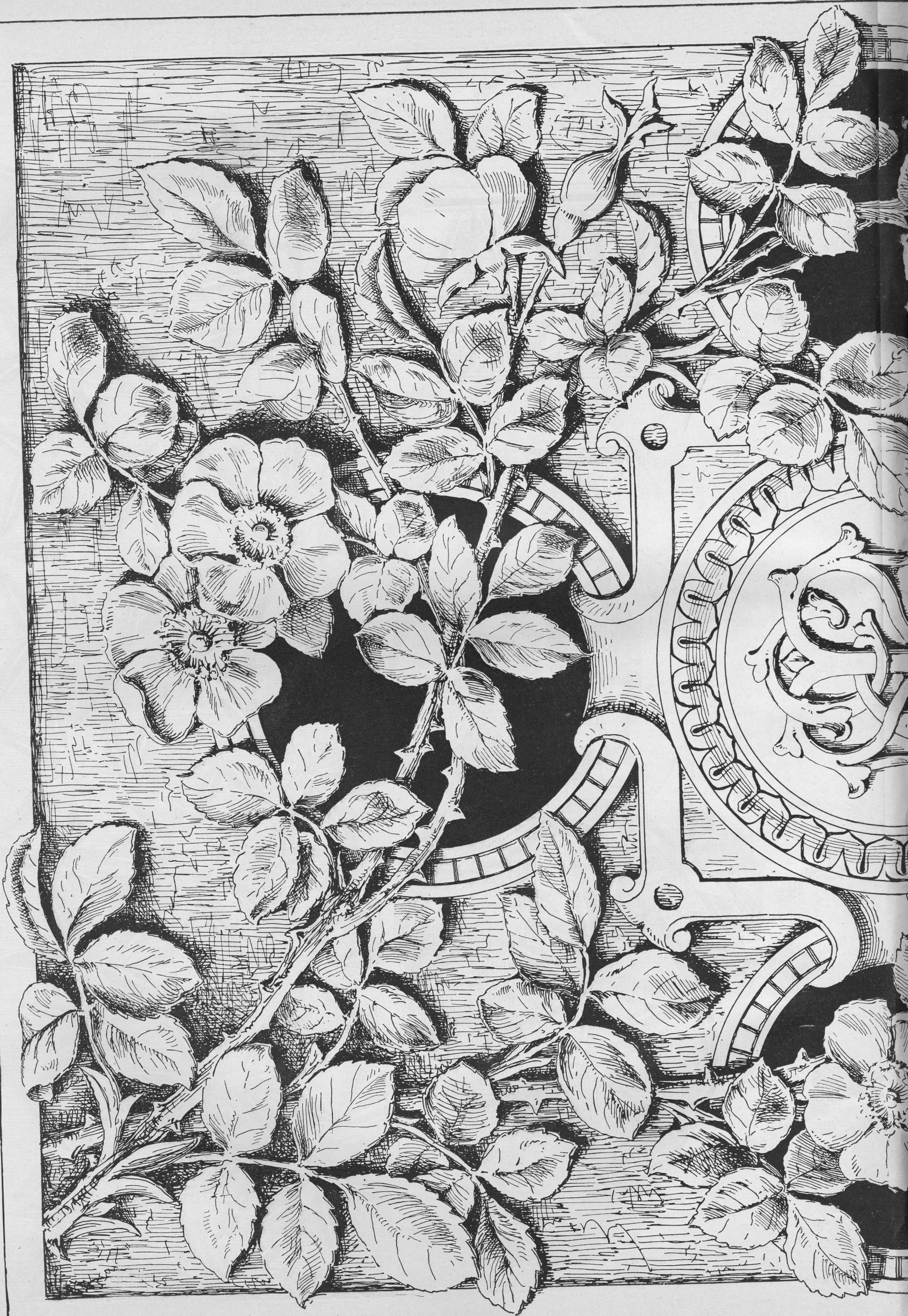
after the Royal Worcester style. The design is simple and needs no shading. Three colors are required, namely: mauve, egg yellow, and bronze green; also some ready prepared matt gold, a bottle of copaiba, some fat oil and turpentine. Two firings will be necessary. Wipe the vase over with turpentine and dry it with a clean rag. Put enough of the mauve powder out to tint the whole vase, with the exception of the base and so much of the neck as is undecorated. Grind the powder with turpentine until it is thoroughly smooth; then add some copaiba to it until it is thin enough to flow freely from the brush; apply the mixture immediately with a broad flat brush and pounce without delay until the tint is quite smooth and even. It is well to have always on hand some clean pouncers, made by tying up a little cotton wool loosely in some pieces of old, soft cambric or silk. When the tint is quite dry, transfer the

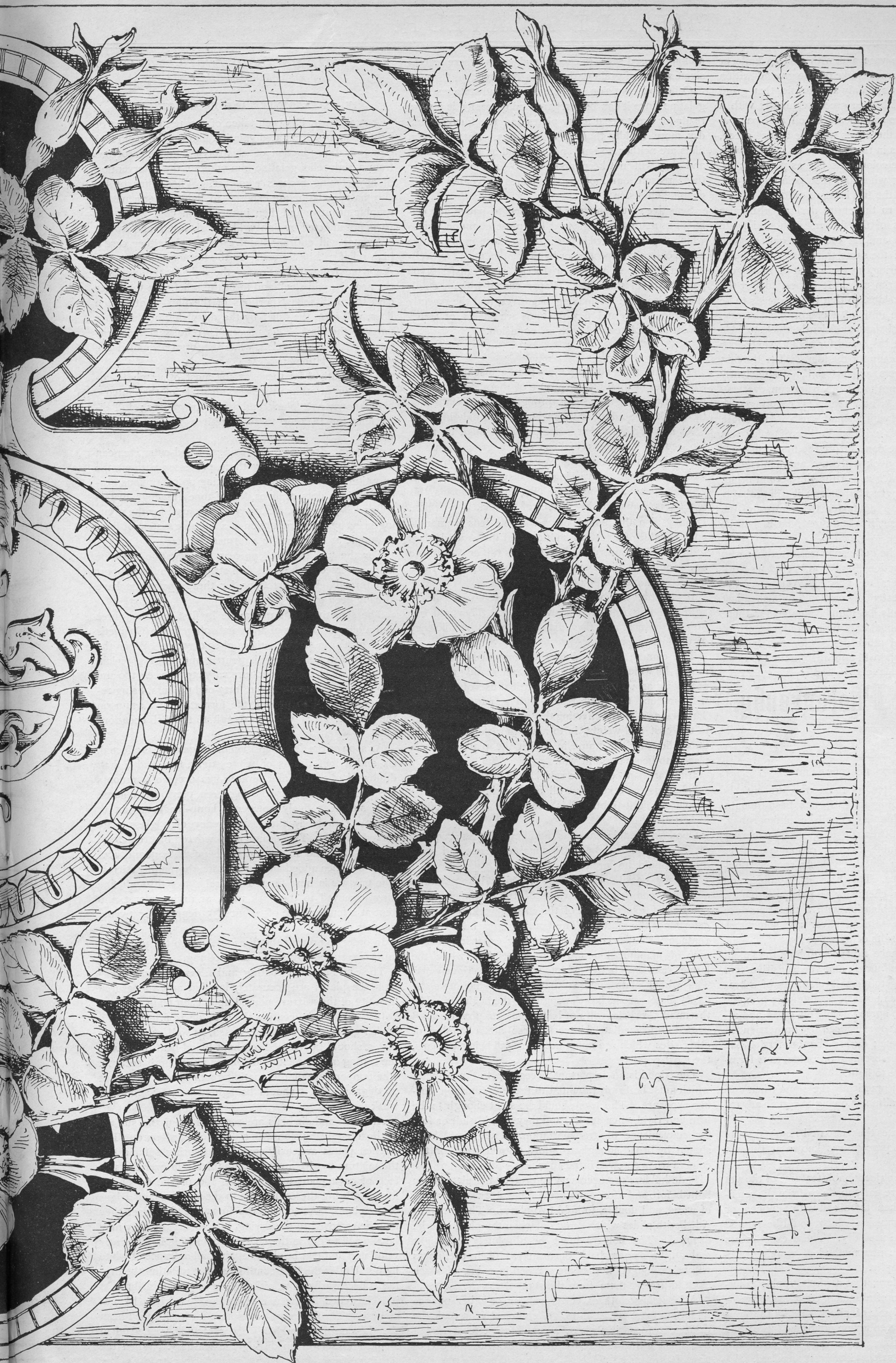


DESIGN FOR "ROYAL WORCESTER" DECORATION.

(FOR DIRECTIONS FOR TREATMENT, SEE OPPOSITE PAGE.)







DESIGN FOR A CARVED AND PERFORATED PANEL. (WILD ROSE.) BY CHARLES M. JENCKES.

design neatly on to the vase and with a sharp knife or scraper, sold for the purpose, take off the ground within the lines of the design as cleanly as possible, then grind up the egg yellow and bronze green separately with a little turpentine; add to each some fat oil, and paint in the flowers yellow and the leaves with the bronze green, leaving the light streaks in the centre to be filled in with gold later on. Lay the color in as flat as possible; re-touch where necessary when the first painting is dry. When this is done and the tint is again allowed to dry, make a raised outline to the entire design; also raise the stalks and centres of the flowers with gold paste mixed with turpentine and fat oil. It requires some skill to keep the line of the same thickness throughout. Next, before the first firing, lay on a coat of matt gold over the vase neck and rim only. It is best to buy the gold prepared on glass slabs, so that it only needs to be ground with turpentine until of a creamy consistency. Lay the gold on smoothly and sufficiently thick to hide the china beneath. Let this stand for about twenty-four hours, and the vase is ready for the kiln. After the first firing repaint the flowers and leaves if not sufficiently opaque; but take care not to let the paint run over any part of the paste which is now ready for covering with gold. Paint on the gold with a small brush. Also put in the centres of the leaves with a flat line of gold; this must on no account be done before the first firing. It will be well to give the neck and base another smooth coating of gold to enrich it. After the second firing, burnish the gold with a glass burnisher; it will probably be necessary to use an agate for the centres of the leaves, also for the outline, if it is desired that it shall be very bright.

These directions will be quite sufficient for those who have followed the instructions for Royal Worcester work given in recent numbers of *The Art Amateur*. "A Lesson in Royal Worcester Decoration," published last December, will, especially, be found valuable for those who have not yet attempted this now popular genre of china painting. Several other designs for this kind of decoration are in hand, and will appear from time to time.

Amateur Photographer.

PHOTOGRAPHY FOR BEGINNERS.

I.—EMULSION PHOTOGRAPHY.

THIS series being written for those who are entirely unacquainted with photography, it has been thought best to begin it with a chapter on emulsion photography.

The sensitive film which is spread on glass, paper, or celluloid, is usually bromide, chloride, or iodide of silver in connection with some suitable vehicle, such as albumen, collodion, or gelatine. The chlorides, bromides and iodides being known in chemistry as halogens, that is, substances which in combination with a metal produce saline compounds, these salts of silver are sometimes spoken of as the haloid salts of silver.

The vehicle or substance first used to hold the haloid salt in suspension was albumen, and the sensitive film was produced by adding to it small quantities of a bromide or an iodide, such as potassic or ammoniac bromide or iodide; this was then spread thinly on glass and allowed to dry, when it was sensitised by immersion in a solution of silver nitrate; during the immersion the nitrate combined with the bromide or iodide, thus forming a haloid salt sensitive to light.

The process remained practically the same when collodion took the place of albumen owing to certain advantages possessed by it.

From the fact that plates thus prepared required to be used while still wet, this process was known as the wet plate process.

In order to remove the objectionable features of the wet process, experiments were early made to form the sensitive salt by itself, and then to mix it with albumen or collodion to form an emulsion which could be poured over the glass plate and used dry. These experiments were successful, and the new method of working was called emulsion photography.

It will be seen, therefore, that a photographic emulsion is simply a solution of albumen, collodion, or gelatine containing a haloid salt of silver, usually the bromide. The expressions "collodion emulsion," "gelatine emulsion," indicate nothing more than the substance with which the sensitive salt is combined or mixed.

Albumen emulsion, owing to its great slowness, is now

no longer used save in exceptional cases where excessive fineness of grain or deposit is required.

Collodion emulsion possesses some advantages over gelatine since it can be prepared more easily, is always ready for use to coat a few plates and the films set and dry more rapidly than gelatine films. But collodion films are neither so hard nor so rapid as gelatine films, and they will not keep good for so long a time. For these reasons our modern dry plates are coated with a gelatine emulsion.

Sensitive emulsions may be applied to paper and celluloid as readily as to glass. The most common use to which paper so coated is put is the production of positive prints either by exposure or by development. The well-known bromide, chloride, aristotype and transferotype papers are of this class. Paper coated with an emulsion is also used for making negatives, and the recently introduced ivory and flexible films are sheets of transparent celluloid coated with an emulsion.

II.—THE CAMERA.

The camera is nothing more than a mechanical contrivance to facilitate the exposure of the plate to the reflected rays of light passing through the lens, while protecting it from all other rays which would only injure it.

As it is necessary that some provision shall be made for securing sharpness of lines on the ground glass or focussing screen, most modern cameras are provided with some means of varying the distance between the ground glass and the lens. In the best forms this motion is imparted by means of a rack and pinion. Usually also the board on which the lens is mounted is capable of a vertical motion, and the ground glass frame is so mounted as to allow its top or bottom to swing out from the camera body. The purpose of these useful adjuncts will be described later on.

If possible the beginner should purchase a camera with a sliding front and a swing back. They add but little to the cost and they greatly increase the efficiency of the instrument.

The camera should always be provided with some means by which it may be easily and readily reversed, according as a horizontal or a vertical use of the plate will produce the best result with a particular view. The best method of effecting this without adding unduly to the cost and weight is to have the camera square, thus allowing the frame in which the plate-holder is placed to be reversed at will.

It is hardly necessary to say that an instrument whose sole purpose is to keep out all needless light should be absolutely light-tight. This should be most carefully looked after.

Good serviceable cameras fulfilling all these requirements can be bought at reasonable prices, and none others should be purchased.

It is not possible to give any specific advice as to the size best adapted to the wants of the beginner. The question of expense and of the cost of working largely determines the matter. The smaller sizes have the advantage of smaller cost, lower working expenses, greater ease of manipulation and lighter weight; while the larger sizes are better adapted to more serious work. The whole plate camera—that is, one which uses the $6\frac{1}{2} \times 8\frac{1}{2}$ plate—seems large enough for the beginner, while the small $3\frac{1}{2} \times 4\frac{1}{2}$ size will not be too small to produce good work. Intermediate between these are a number of other sizes which are much used, the 5×8 being, perhaps, the most popular.

The tripod is an important accessory to the camera, which must be firmly mounted to prevent vibration during exposure. The legs should be stout enough to be firm and rigid when set up, and they should slide or fold for convenience of transportation. The tripod head should be broad enough to afford a good base for the camera when screwed in position.

Plate-holders are necessary to protect the plates from light before and after exposure. They are usually made of wood, and double, to hold two plates. They are provided with slides which draw out when the plate is to be exposed. The holders must be absolutely light-tight and fit the camera-back accurately. Their usefulness will be prolonged if they are carried in a bag of black cloth to protect them from the sun.

A focussing cloth of velvet, rubber, or other opaque material, large enough to go completely around the camera, a focussing glass, a small spirit level and a note book will complete the field outfit, with the exception of the lenses, which will be considered in the next chapter.

W. H. B.

THE PHOTO-ZINC AND PHOTO-ENGRAVING PROCESSES.

IV.—STEREOTYPES AND ELECTROTYPES.

ADVANTAGE has been taken of the peculiar effect of light upon a bichromated gelatine film for the rapid and economical production of electrotypes and stereotypes from a high relief gelatine film without the intervention of any etching process whatever. When films of bichromated gelatine are exposed to light under a photographic negative and then immersed in cold water, the parts not affected by light will absorb water and swell; hot water will entirely dissolve them. In either case a high relief will be formed. In the former case the parts protected from the action of the light by the blacks of the negative will swell and form the relief. In the latter case the undissolved portions of the film—that is, the lines, will form the relief by the dissolving of the other parts of the film. This process is technically known as the "Wash-Out" process, while the former is called the "Swelled Gelatine" process.

The negatives for these, as for most other photo-engraving or printing processes, must be of that intense kind known as "black and white" negatives; full directions for making these negatives were given last month.

Only line drawings, engravings, wood-cuts, etc., can be directly reproduced by these processes without the adoption of some means of breaking up continuous gradations into dots or lines. Half-tone drawings, water-colors, oil-paintings, etc., may be prepared for the printing press by the introduction of a suitable system of lines or stipple as described in a former article.

For the "Wash-Out" process the negative must be made reversed, or have its film stripped from its support and turned. Full directions for these operations have already been given.

The sensitive films are made by first swelling three and a quarter ounces of any good soft gelatine (Coignet's or Nelson's) in sixteen ounces of cold water. When the gelatine is well swollen it is poured out into a porcelain dish and kept at a temperature varying between 100 and 120 degrees Fahrenheit for forty-eight hours, being repeatedly stirred to prevent the formation of a scum on the surface. It is well also to agitate the dish occasionally.

As soon as the decomposition of the gelatine is effected, six and a half drams of white sugar, two and a half drams of glycerine and seventy-five drops of ammonia are added, the mixture having been previously colored with sufficient finely powdered lamp-black, as not to destroy completely the transparency of a glass plate coated with it. Two drams of powdered bichromate of potash dissolved in the smallest possible quantity of water are then added and the solution thoroughly stirred. The mixture is next filtered several times through fine linen, removed to the dark room or drying closet, and kept at a temperature of about 135 degrees for twenty minutes.

In order to prevent the films sticking to the plates the latter are rubbed over with an oiled rag.

To secure an even coating and films of equal thickness, the plates are accurately levelled and a measured quantity of the mixture poured upon each plate.

Just previous to coating the gelatine is filtered into a beaker glass. All the vessels used, as well as the glass plates, should be warmed to about blood heat to prevent the setting of the gelatine before an even film is secured. The temperature of the coating room should be about 70 degrees, and it should be lighted only by yellow or weak daylight.

All scum and air bells are removed from the surface of the filtered emulsion with a piece of cardboard. The levelled plates are easily coated by pouring sufficient of the mixture to give a moderately thick film over the surface of each plate, using a glass rod or the tip of the finger to bring the coating up to the corners and edges of the plates. As soon as the films are firmly set they may be removed to the drying box to dry, or they may be allowed to dry in the coating room if it is efficiently ventilated and can be closed against all entrance of white light. Under the best conditions of ventilation the drying is necessarily slow, although in large establishments it is hastened by the use of rotary fans driven by machinery. The film must on no account be stripped from the glass until it is perfectly dry, or it will be pulled out of shape and shrivel up during the washing. When the film is perfectly dry it is cut around close to the edge, one corner is started, and the film is gradually pulled